SYSTEM AND METHOD FOR IMPLEMENTING BEHAVIORAL OPERATIONS

Related Applications

This patent claims priority on the provisional patent application entitled "Behavioral Set and Field Descriptor Implementations in DPP", serial No. 60/240,028, filed October 13, 2000, assigned to the same assignee as the present application.

Field of the Invention

The present invention relates generally to the field of computer searching systems and more particularly to a system and method of behavioral operations.

Background of the Invention

It is commonly required in computers to find a particular string of data. For instance, a user might want to identify all of his documents that have a particular word. The computer creates a window the size of the word and starts searching all the files on the computer's hard disk for the word. Another example is firewalls and anti-virus programs.

Unfortunately, the user might be looking for several words of differing lengths or signatures having different lengths. As a result the computer has to create search windows of differing lengths. Assume one search window is three bytes and a second window is four bytes. We have to form two comparisons for each new byte of data. One comparison that contains the new byte of data and two old bytes of data and a second comparison that contains the new byte of data and three old bytes of data. This is a very processor intensive process. Note that if several three byte words (addresses) are being search for, the process requires a comparison for each of these words.

In addition to these problems it often happens that the items being searched for is not the final item required, but a trigger for the search to proceed in another direction or under different circumstances (behavior). For instance, network data is often contained in packets. The information that the user wants to scan is contained in the data portion of the packet, however it is common to have multiple types of packets encased in the packet. The search has to skip over the header information for all the encapsulated packets and find the actual data. Present solutions to this problem use groups of finite state machines (FSA - finite state automata). Unfortunately, when the number of possibilities to be examined expands the number of FSAs and their connections grow exponentially. This means that the programmers' efforts grow exponentially and the possibility of mistakes grow exponentially.

Thus there exists a need for a search process has the flexibility to deal with complex searching problems.

Brief Description of the Drawings

FIG. 1 is a schematic diagram of a sliding window search routine in accordance with one embodiment of the invention;

FIGs. 2 & 3 are a flow chart of the steps used in performing a sliding window search in accordance with one embodiment of the invention;

FIGs. 4 & 5 are a flow chart of the steps used in performing a sliding window search in accordance with another embodiment of the invention;

FIG. 6 is a flow chart of the steps used in performing a sliding window search in accordance with another embodiment of the invention;

FIG. 7 is a flow chart of the steps used in an icon shift function in accordance with one embodiment of the invention;

FIG. 8 is a flow chart of the steps used in an icon unshift function in accordance with one embodiment of the invention;

FIG. 9 is a flow chart of the steps used in a transform function in accordance with one embodiment of the invention;

FIG. 10 is a flow chart of the steps used in an untransform function in accordance with one embodiment of the invention;

FIG. 11 is an example of a transform lookup table;

FIG. 12 is an example of a transform translation table;

FIG. 13 is a block diagram of a system for associative processing in accordance with one embodiment;

FIG. 14 is a linear feedback register used to calculate an icon (CRC, polynomial code) in accordance with one embodiment of the invention;